

Accepted Manuscript

Micromechanical and dynamic mechanical analyses for characterizing improved interfacial strength of maleic anhydride compatibilized basalt fiber/polypropylene composites

Seongyeol Pak, Sunmin Park, Young Seok Song, Doojin Lee

PII: S0263-8223(18)30435-5

DOI: <https://doi.org/10.1016/j.compstruct.2018.03.020>

Reference: COST 9467

To appear in: *Composite Structures*



Please cite this article as: Pak, S., Park, S., Song, Y.S., Lee, D., Micromechanical and dynamic mechanical analyses for characterizing improved interfacial strength of maleic anhydride compatibilized basalt fiber/polypropylene composites, *Composite Structures* (2018), doi: <https://doi.org/10.1016/j.compstruct.2018.03.020>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Micromechanical and dynamic mechanical analyses for characterizing improved interfacial strength of maleic anhydride compatibilized basalt fiber/polypropylene composites

Seongyeol Pak¹, Sunmin Park², Young Seok Song^{3,*}, Doojin Lee^{2,*}

Abstract

For fiber reinforced polymer composites, it is important to obtain a good interfacial bonding between the fibers and the polymer matrix to enhance the physical properties of the composites. In particular, the mechanical and thermal properties of the composites differ depending on the interfacial bonding strength, lengths, and orientations of the fibers. We investigate the microstructural anisotropy of the basalt fiber reinforced polypropylene composites and evaluate their mechanical properties, such as elastic modulus and ultimate tensile strength in order to understand the relationship between the local anisotropy and mechanical strength of the composites. Dynamic mechanical and thermal analyses are performed to characterize the grafting effect of maleic anhydride polypropylene on the basalt fibers. The grafting effect enhances the bonding strength between the basalt fibers and matrix and the thermomechanical properties of the composites. The elastic modulus and ultimate tensile strength of the composites with the grafting effect show enhancement compared to the composites without the grafting effect. The predictions of the elastic modulus by the Mori-Tanaka model

Email addresses: ysong@dankook.ac.kr (Young Seok Song), doojin@kicet.re.kr (Doojin Lee)

¹Department of Materials Science and Engineering, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul, 08826, Korea

²Ceramic Fiber and Composite Materials Center, Korea Institute of Ceramic Engineering and Technology, 101 Soho-ro, Jinju-si, Gyeongsangnam-do, 52851, Korea

³Department of Fiber System Engineering, Dankook University, 152 Jukjeon-ro, Suji-gu, Gyeonggi-do, 16890, Korea

Download English Version:

<https://daneshyari.com/en/article/6703507>

Download Persian Version:

<https://daneshyari.com/article/6703507>

[Daneshyari.com](https://daneshyari.com)